

## REMARKS

Claims 32-37 are pending in this application. Claims 34 and 37 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. Claim 32 is rejected as anticipated under 35 USC 102(b) by Toyota (JP 63-274751) or Friese. Claim 32 is rejected as anticipated under 35 USC 102(e) by Hasz (5,914,189 or 5,773,141). Claims 33, 35 and 36 are rejected as anticipated under 35 USC 102(b) by Kimura. Claims 33, 35 and 36 are rejected as anticipated under 35 USC 102(b) by Anderson, Rowcliffe, GE (EP 0 608 081) Norton or Homberger.

The applicants appreciate the thorough search conducted by the Examiner, and several of the claims have been amended in response to the teachings of the cited prior art. However, the applicants also respectfully disagree with several of the claim rejections asserted by the Examiner.

The applicants traverse the rejection of claims 34 and 37 under 35 USC 112, first paragraph. The Examiner states that the original specification does not reasonably provide enablement for a coating with both a normal spinel and an inverse spinel layer. However, the applicants find the enablement for these claims in the second paragraph of page 5 of the Preliminary Amendment filed on May 3, 2000. That paragraph states, "Even with a transition of a spinel from its normal form to the inverse form, or at least partially to the inverse form, there are no abrupt changes in the physical-chemical properties. The transition from normal to inverse spinel can thus be considered an order-disorder induced phase transition of the second order, which has no great influence on the properties of the thermal barrier coating." Accordingly, the limitation of "wherein a first portion of the thermal barrier coating comprises a normal spinel material and a second portion of the thermal barrier coating comprises an inverse spinel material" contained in claims 34 and 37 is supported by the written description, and these two claims are in condition for allowance.

The applicants have amended claim 32 to further limit the selection of the oxide material that is admixed with the spinel material. In particular, the group of

oxide materials has been amended to eliminate zirconia ( $\text{ZrO}_2$ ) and alumina ( $\text{Al}_2\text{O}_3$ ), thereby avoiding the teachings of Toyota and Friese. Accordingly, these amendments overcome the rejection of claim 32 under 35 USC 102(b) and place claim 32 in condition for allowance.

The applicants traverse the rejection of claim 32 under 35 USC 102(e) as being anticipated by Hasz (5,914,189 or 5,773,141). Each of these two cited patents discloses the use of only one type of spinel material, i.e.  $\text{MgAl}_2\text{O}_4$ . No other spinel material is taught or suggested by the Hasz patents. Accordingly, the rejection under 35 USC 102(e) is not supported by the art and should be withdrawn.

The applicants traverse the rejection of claims 33, 35 and 36 under 35 USC 102(e) as being anticipated by Kimura. Firstly, Kimura discloses a refractory material used as a brick for a furnace. Kimura does not disclose the use of this refractory material as a thermal barrier coating disposed over a metallic substrate. Claims 33, 35 and 36 each include the limitations of a metallic substrate and a thermal barrier coating disposed on the metallic substrate. Accordingly, Kimura fails to disclose each limitation of the rejected claims, and the rejection under 35 USC 102(e) should be withdrawn.

Furthermore, claims 33 and 35 (and thus dependent claim 36) have each been amended to further limit the group of spinel materials. In particular,  $\text{NiFe}_2\text{O}_4$  has been eliminated from the group of spinel materials. Since  $\text{NiFe}_2\text{O}_4$  is the only spinel material disclosed by Kimura, it is impossible for Kimura to anticipate or to suggest the amended claims 33, 35 and 36. Each of these claims is now in condition for allowance.

The applicants traverse the rejection of claims 33, 35 and 36 as being anticipated under 35 USC 102(b) by Anderson, Rowcliffe, GE, Norton or Hornberger. Firstly, none of Anderson, Rowcliffe, Norton or Hornberger discloses the use of any spinel material. If the Examiner believes otherwise, it is requested that a specific location be identified within each of these references wherein the claimed spinel materials is taught. A physical review of these patents and an electronic search of an electronic copy of these patents

conducted by the undersigned attorney has failed to identify the word "spinel" in any of these references. The applicants find the rejection of claims 33, 35 and 36 under 35 USC 102(b) not to be supported by the Anderson, Rowcliffe, Norton or Homberger references.

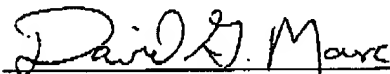
With respect to the GE (EP 0 608 081 reference), the only spinel material disclosed is  $\text{MgAl}_2\text{O}_4$ , which does not anticipate the claimed group of spinel materials. Thus, the rejection of claims 33, 35 and 36 under 35 USC 102(b) is not supported by the GE reference.

Furthermore, the spinel material disclosed by the GE reference is not admixed with an oxide material, such as is claimed in claims 33 and 36. This is further evidence that the rejection of claims 33 and 36 under 35 USC 102(b) is not supported by the GE reference.

New claims 38-40 have been added to more fully encompass the applicants' invention.

Reconsideration of the amended application in light of the above Remarks and allowance of claims 32-40 are respectfully requested.

Respectfully submitted,



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